Data Validation Checklist
Inorganic Analyses

Project:	35TH Avenue Superfund Site	Project No:	60430028; 1
Laboratory:	TestAmerica – Savannah, GA	Job ID.:	680-107310-1
Method:	SW-846 6010C[1]	Associated Samples:	Refer to **Attachment A** (Sample Summary)
Matrix:	Soil	Date(s) Collected:	11/13/2014
Reviewer:	Teresa Amentt Jennings, URS Group, Inc.	Date:	08/24/2015
Concurrence[2]:	Martha Meyers-Lee, URS Group, Inc.	Date:	08/31/2015

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
1. Were sample preservation requirements met? If pH of aqueous sample >2 and was not adjusted by laboratory prior to analysis, J- flag positive results and R- flag non-detect results.			✓		
2. Were all COC records signed and integrity seals intact, indicating that COC was maintained for all samples?	✓				
3. Were there any problems noted in laboratory data package concerning condition of samples upon receipt?		✓			
4. Do any soil/sediment samples contain more than 50% water? If yes, then results are to be reported on a wet-weight basis.		✓			
5. Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: ≤28 days, other metals: ≤6 months; Cr+6: ≤24 hours from extraction). If not, then J- flag positive results and R- flag non-detect aqueous results.		✓			
6. Were results for all project-specified target analytes reported?	✓				
7. Were project-specified Reporting Limits achieved for undiluted sample analyses?		✓		Resident Soil RSL with THQ = 1.0 (ORNL, June 2015) for target analytes: • Aluminum: 77000 mg/kg • Arsenic: 0.68 mg/Kg • Iron: 55000 mg/kg • Lead: 400 mg/Kg The MDL for each target analyte was less than the respective above-mentioned RSL in undiluted samples, except arsenic in samples 680-107310-5 (CV1063B-CS0-4") where the MDL was 0.71 mg/Kg. A data gap does not exist, as arsenic was detected in the sample.	
8. Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, batch, matrix, and level)?	✓				

[1]Aluminum, arsenic, iron, and lead
[2] Independent technical reviewer

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
9. Was a calibration blank (ICB/CCB) analyzed at the beginning, after every 10th sample, and at the end of each analytical run?	✓				
10. Were target analytes detected in the method and/or calibration blanks?		✓		Target analyte was not detected in the method blank. Calibration blanks were not evaluated.	
11. Were target analytes reported in equipment/rinsate blanks analyses above the DL?			✓	According to the QAPP, a rinsate blank is to be collected after each decontamination event, which occurs once a week, per the client. A rinsate blank is not associated with this sampling event. Blank contamination will be evaluated based on method blank results.	
12. Were contaminants detected in samples below the blank contamination action level? o If blank result > RL, • Flag sample results ≤ RL with a U • Flag positive sample results > RL and ≤10x blank result , as J+ positive results o If blank result ≤RL, • Flag sample results ≤ RL with a U • Flag positive sample results > RL and ≤10x blank result , as J+ positive results			✓	Target analytes were not detected during the analysis of the method blank. An evaluation of the effect of blank contamination on soil sample results was based on method blank results, and not calibration blank results.	
13. Are there negative laboratory blank results with the absolute value ≤RL? If yes, then flag positive and non-detect sample results that are < 10x absolute blank value as J- and UJ, respectively.		✓			
14. Was a field duplicate analyzed?	✓			CV1063A-CSD0-4" (680-107310-4) is a field duplicate of CV1063A-CS0-4" (680-107310-3).	
15. Was precision deemed acceptable as defined by the project plans?	✓			Refer to **Attachment B** (Field Duplicate Evaluation)	
16. Were initial and continuing calibration standards analyzed at the lab/project-specified frequency for each instrument? o 6010C: • ICAL: Blank and one standard • ICV initially, and CCV every 10th sample and at the end of the analytical run • Lower Limit of Quantitation Check Sample (CRI) to be analyzed after establishing lower laboratory reporting limits and as needed	✓			6010C: 11/20/2014 and 11/21/2014. One blank and one standard initially. ICV initially, and CCV every 10 samples and at end of run. CRI after initial calibration blank analysis.	
17. Were these results within lab/project specifications? o 6010C • ICV/CCV (Criteria: 90-110%R): ▪ If %R <75, then J- flag positive results and R-flag non-detects ▪ If 75-89%R, then J- flag positive results and UJ flag non-detects ▪ If 111-125%R, then J flag positive results ▪ If >125%R, then J+ flag positive results	✓				

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
▪ If >160%R, then R flag positive results • CRI (Method: 70-130%R, Laboratory: 50-150%R; Project: 50-150%R for Sb, Pb, and Tl, and 70-130%R for all other analytes): ▪ If CRI %R <50 (<30% for Sb, Pb, TL), then R flag results ≤ 2x RL and J flag positive results >2x RL ▪ If CRI %R 50-69% (30-49% for Sb, Pb, TL), then J- and UJ flag positive results <2x RL and ND, respectively ▪ If CRI %R >130% and ≤180% (>150%, but ≤200% for Sb, Pb, TL), then J+ flag positive results <2x RL ▪ If CRI %R >180% (>200% for Sb, Pb, TL), then R flag positive results					
18. Was the interference check sample (ICS) analyzed at the beginning of each ICP analytical run?	✓				
19. Are ICS recoveries within 80-120% of the true value? If not, qualify data as follows when native Al, Fe, Ca, and Mg sample concentrations are equal to or greater than the ICS spiking level: o If >120%R (or >true value plus 2x CRQL), J+ flag positive results o If 50-79%R (or less than true value – 2x the CRQL), J- flag positive results and UJ flag non-detects o If <50%R, J- flag positive results and R-flag non-detects	✓				
20. Was a LCS analyzed for each preparation batch (one per 20 samples per matrix and level)?	✓				
21. Did LCS recoveries meet method/laboratory/project (80-120%R) specifications? o Soil: • LCS result > Upper control limit (UCL): J+ flag positive results • LCS result < Lower control limit (LCL): J- flag positive results and UJ flag non-detects	✓				
22. Was the RPD between LCS and LCSD results within method/laboratory /project control limits (≤20%RPD)? If not, J and UJ flag positive and non-detect results, respectively			✓	LCS only	
23. Was a Matrix Spike (MS) and Matrix Spike Duplicate (MSD) analyzed once per preparation batch?	✓				
24. Is the MS and MSD parent sample a project-specific sample?	✓			Prep Batch 359032: 680-107310-6 (CV0971A0APa-CS0-4"), MS/MSD/PDS	
25. Was a post-digestion spike (PDS) analysis conducted when MS and/or MSD results did not meet control limits (Note: PDS is not required for silver, mercury, or hexavalent chromium)?	✓				
26. For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within method (6010C: 75-125%R MS/MSD and 80-120%R PDS; 7471A: 80-120%R MS/MSD; 7196A: 85-115%R MS), laboratory (MS, MSD, and PDS: 75-125%R for 6010C/7471 (as		✓		FM0281C-CS18" (680-107310-6), 6010C: Lead MS and MSD %R @ 53 and 70 (75-125%R). PDS recovery is reported as "NC" in laboratory data package, and calculated by data reviewer to be 96% (80-120%R). J Flag result.	J

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
applicable) and 80-120%R for 7196), and project (as noted below) specifications? *Only QC results for project samples are evaluated.* If not, o 6010C: • If MS %R <30 and PDS %R <75, then J- and R Flag positive and ND results, respectively • If MS %R <30 and PDS %R >75, then J flag positive and UJ flag non-detect results • If MS and MSD %R 30-74 and PDS%R <75, then J- flag positive and UJ flag non-detect results • If MS and MSD %R 30-74 and PDS%R ≥75, then J flag positive and UJ flag non-detect results • If MS, MSD, and PDS %R >125, J+ flag positive results • If MS and MSD %R >125 and PDS %R ≤125, then J flag positive results • If MS and MSD %R <30 and no PDS, then J- flag positive and R-flag non-detect results • If MS and MSD %R 30-74 and no PDS, then J- and UJ flag positive and non-detect results, respectively • If MS and MSD %R >125 and no PDS, then J+ flag positive results					
27. For all analytes with sample concentration < 4 x spike concentration, were laboratory/project (≤20%RPD) criteria met for precision during the MS and MSD analysis? *Only QC results for project samples are evaluated.* o If RPD >20%, J and UJ flag positive and non-detect results.	✓				
28. Was a serial dilution conducted for 6010C/EPA 200.7?	✓				
29. Is the serial dilution parent sample a project-specific sample?	✓			680-107310-6 (FM0281C-CS18")	
30. Is the percent difference between the serially diluted result and undiluted result less 10% (for those analytes with native concentrations greater than 50x the DL)? *Only QC results for project samples are evaluated.* o If %D >10, J and UJ flag positive and non-detect results, respectively.	✓				
31. Was a laboratory duplicate analyzed?		✓			
32. Was the lab duplicate analysis conducted on a project-specific sample?			✓		
33. Were criteria for laboratory/project precision met? *Only QC results for project samples are evaluated.* o If RPD values >20% (35% for soil/sediment) or absolute difference > RL (2x RL for soil/sediment), then J and UJ flag positive and non-detect results, respectively			✓		
34. Were lab comments included in report? If yes, summarize contents or attach a copy of the narrative.	✓			Refer to **Attachment C** (Case Narrative)	

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
Comments: The data validation was conducted in accordance with the *Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1* (OTIE, October 2012). The data review process was modeled after the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Inorganic Data Review* (EPA 540-R-04-004, October 2004). Sample results have been qualified based on the results of the data review process (**Attachment D**). Criteria for acceptability of data were based upon available site information, analytical method requirements, guidance documents, and professional judgment.					

DV Flag Definitions:

J- The result is an estimated quantity, but the result may be biased low.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

U The analyte was analyzed for, but was not detected above the associated level; blank contamination may exist.

UJ The analyte was analyzed for, but was not detected. The reported limit is approximate and may be inaccurate or imprecise.

ATTACHMENT A

SAMPLE SUMMARY

SAMPLE SUMMARY

Client: Oneida Total Integrated Enterprises LLC

Job Number: 680-107310-1
Sdg Number: 680-107310-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-107310-1	CV1061A-CS0-4"	Solid	11/13/2014 1035	11/15/2014 0930
680-107310-2	CV1061B-CS0-4"	Solid	11/13/2014 1040	11/15/2014 0930
680-107310-3	CV1063A-CS0-4"	Solid	11/13/2014 1105	11/15/2014 0930
680-107310-4	CV1063A-CSD0-4"	Solid	11/13/2014 1110	11/15/2014 0930
680-107310-5	CV1063B-CS0-4"	Solid	11/13/2014 1115	11/15/2014 0930
680-107310-6	CV0971A0APa-CS0-4"	Solid	11/13/2014 1145	11/15/2014 0930
680-107310-6MS	CV0971A0APa-CS0-4"	Solid	11/13/2014 1145	11/15/2014 0930
680-107310-6MSD	CV0971AOAPa-CS0-4"	Solid	11/13/2014 1145	11/15/2014 0930

ATTACHMENT B

FIELD DUPLICATE EVAULATION

Evaluation of Field Duplicate Results **Attachment B**

Analyte	CV1063A-CS0-4" 680-107310-3	RL	CV1063A-CSD0-4" 680-107310-4	RL	Unit	Avg. RLx5	RPD	Absolute difference	2x Avg RL	Action
Aluminum	13000	22	13000	21	mg/kg	108	0	NA	NA	None, RPD ≤ 50%
Arsenic	25	2.2	26	2.1	mg/kg	10.8	4	NA	NA	None, RPD ≤ 50%
Iron	45000	22	46000	21	mg/kg	108	2	NA	NA	None, RPD ≤ 50%
Lead	310	1.1	320	1.0	mg/kg	5.3	3	NA	NA	None, RPD ≤ 50%

Note: If the analyte was not detected, then the cell was left blank.

mg/kg - milligrams per kilogram
NA - Not applicable
RL - Reporting limit
RPD - Relative percent difference

Precision is based on either the absolute difference between sample results or RPD. If the sample results are less than or equal to 5x's the RL, then precision is based on the absolute difference between duplicate results. If sample results >5x's RL, then precision is evaluated using RPD. J-Flag sample results whenever the absolute difference is greater than the RL (2x for soils) or the RPD >20% (50% for soil). Table above presents the

ATTACHMENT C

CASE NARRATIVE

CASE NARRATIVE
Client: Oneida Total Integrated Enterprises LLC
Project: 35th Avenue Superfund Site
Report Number: 680-107310-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 11/15/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.3 C.

SEMIVOLATILE ORGANIC COMPOUNDS (GC/MS) LOW LEVEL PAH

Samples CV1061A-CS0-4" (680-107310-1), CV1061B-CS0-4" (680-107310-2), CV1063A-CS0-4" (680-107310-3), CV1063A-CSD0-4" (680-107310-4), CV1063B-CS0-4" (680-107310-5) and CV0971A0APa-CS0-4" (680-107310-6) were analyzed for Semivolatile Organic Compounds (GC/MS) Low level PAH in accordance with EPA SW846 Method 8270D. The samples were prepared on 11/17/2014 and analyzed on 11/19/2014.

Samples CV1061A-CS0-4" (680-107310-1)[10X], CV1061B-CS0-4" (680-107310-2)[10X], CV1063A-CS0-4" (680-107310-3)[10X], CV1063A-CSD0-4" (680-107310-4)[10X], CV1063B-CS0-4" (680-107310-5)[10X] and CV0971A0APa-CS0-4" (680-107310-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly. As such, surrogate were diluted out and are not reported. Also elevated reporting limits (RLs) are provided.

Benzo[k]fluoranthene, Fluoranthene and Pyrene recovered outside the recovery criteria low for the MS of sample CV0971A0APa-CS0-4"MS (680-107310-6) in batch 680-359503.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)

Samples CV1061A-CS0-4" (680-107310-1), CV1061B-CS0-4" (680-107310-2), CV1063A-CS0-4" (680-107310-3), CV1063A-CSD0-4" (680-107310-4), CV1063B-CS0-4" (680-107310-5) and CV0971A0APa-CS0-4" (680-107310-6) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/17/2014 and analyzed on 11/20/2014.

Lead recovered outside the recovery criteria low for the MS/MSD of sample CV0971A0APa-CS0-4' (680-107310-6) in batch 680-359921. Aluminum failed the recovery criteria high.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS/MOISTURE

Samples CV1061A-CS0-4" (680-107310-1), CV1061B-CS0-4" (680-107310-2), CV1063A-CS0-4" (680-107310-3), CV1063A-CSD0-4" (680-107310-4), CV1063B-CS0-4" (680-107310-5) and CV0971A0APa-CS0-4" (680-107310-6) were analyzed for Percent Solids/Moisture in accordance with TestAmerica SOP. The samples were analyzed on 11/15/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ATTACHMENT D

QUALIFIED SAMPLE RESULTS

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV1061A-CS0-4''
Lab Sample ID: 680-107310-1
Lab Name: TestAmerica Savannah
Job No.: 680-107310-1
SDG ID.: 680-107310-1
Matrix: Solid
Date Sampled: 11/13/2014 10:35
Reporting Basis: DRY
Date Received: 11/15/2014 09:30
% Solids: 85.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	20	10	mg/Kg			1	6010C
7440-38-2	Arsenic	55	2.0	0.60	mg/Kg			1	6010C
7439-89-6	Iron	69000	20	7.1	mg/Kg			1	6010C
7439-92-1	Lead	500	1.0	0.54	mg/Kg			1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV1061B-CS0-4''
Lab Sample ID: 680-107310-2
Lab Name: TestAmerica Savannah
Job No.: 680-107310-1
SDG ID.: 680-107310-1
Matrix: Solid
Date Sampled: 11/13/2014 10:40
Reporting Basis: DRY
Date Received: 11/15/2014 09:30
% Solids: 85.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	21	10	mg/Kg			1	6010C
7440-38-2	Arsenic	41	2.1	0.61	mg/Kg			1	6010C
7439-89-6	Iron	77000	21	7.2	mg/Kg			1	6010C
7439-92-1	Lead	370	1.0	0.55	mg/Kg			1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV1063A-CS0-4'' Lab Sample ID: 680-107310-3

Lab Name: TestAmerica Savannah Job No.: 680-107310-1

SDG ID.: 680-107310-1

Matrix: Solid Date Sampled: 11/13/2014 11:05

Reporting Basis: DRY Date Received: 11/15/2014 09:30

% Solids: 81.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	22	11	mg/Kg			1	6010C
7440-38-2	Arsenic	25	2.2	0.66	mg/Kg			1	6010C
7439-89-6	Iron	45000	22	7.8	mg/Kg			1	6010C
7439-92-1	Lead	310	1.1	0.59	mg/Kg			1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV1063A-CSD0-4'' Lab Sample ID: 680-107310-4

Lab Name: TestAmerica Savannah Job No.: 680-107310-1

SDG ID.: 680-107310-1

Matrix: Solid Date Sampled: 11/13/2014 11:10

Reporting Basis: DRY Date Received: 11/15/2014 09:30

% Solids: 82.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	21	10	mg/Kg			1	6010C
7440-38-2	Arsenic	26	2.1	0.61	mg/Kg			1	6010C
7439-89-6	Iron	46000	21	7.2	mg/Kg			1	6010C
7439-92-1	Lead	320	1.0	0.54	mg/Kg			1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV1063B-CS0-4'' Lab Sample ID: 680-107310-5

Lab Name: TestAmerica Savannah Job No.: 680-107310-1

SDG ID.: 680-107310-1

Matrix: Solid Date Sampled: 11/13/2014 11:15

Reporting Basis: DRY Date Received: 11/15/2014 09:30

% Solids: 82.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	24	12	mg/Kg			1	6010C
7440-38-2	Arsenic	27	2.4	0.71	mg/Kg			1	6010C
7439-89-6	Iron	46000	24	8.5	mg/Kg			1	6010C
7439-92-1	Lead	610	1.2	0.64	mg/Kg			1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CV0971A0APa-CS0-4'' Lab Sample ID: 680-107310-6

Lab Name: TestAmerica Savannah Job No.: 680-107310-1

SDG ID.: 680-107310-1

Matrix: Solid Date Sampled: 11/13/2014 11:45

Reporting Basis: DRY Date Received: 11/15/2014 09:30

% Solids: 84.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Meth
7429-90-5	Aluminum	13000	21	10	mg/Kg			1	6010C
7440-38-2	Arsenic	23	2.1	0.61	mg/Kg			1	6010C
7439-89-6	Iron	36000	21	7.3	mg/Kg			1	6010C
7439-92-1	Lead	190	1.0	0.55	mg/Kg		J	1	6010C

Sample results have been qualified by URS in accordance with the Non-Industrial Use Property Sampling Event QAPP for the 35th Avenue Removal Site, Birmingham, Alabama, Revision 1 (OTIE, October 2012)